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09/516,082	03/01/2000	Satoshi Murakami	SEL163	3545

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EXAMINER

LEE, EUGENE

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 10/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/516,082

Applicant(s)

MURAKAMI ET AL.

Examiner

Eugene Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 46-88 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 46-88 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7/7/04</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/7/04 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 46, 47, 59, and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by Kadota et al. 5,818,550. Kadota discloses (see, for example, FIG. 1) a semiconductor device

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comprising a first thin film transistor formed over a TFT substrate (insulating surface) 0 wherein the first thin film transistor comprises a semiconductor film 2, source and drain region S/D, channel forming region, gate insulating film, gate electrode 3; first inter-layer insulating film (interlayer insulating film) 4, electrodes (conductive layer) 7, color filter 9R/9G/9B, and pixel electrode 1. The color filter has a flattened surface.

Regarding the limitation “a semiconductor film comprising crystalline silicon”, see, for example, column 3, line 64 wherein Kadota discloses the semiconductor film being a polycrystalline silicon thin film.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 48 thru 55, 60, 61, 66, and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. ‘550 as applied to claims 46, 47, 59, and 65 above, and further in view of Seo 6,323,521. Kadota does not disclose the interlayer insulating film comprising at least a material selected from the group consisting of silicon nitride, silicon oxide and nitrated silicon oxide. However, Seo discloses (see, for example, FIG. 6D) a semiconductor device comprising a gate insulating interlayer (interlayer insulating film) 219 over a thin film transistor. In column 9, lines 3-8, Seo discloses the gate insulating interlayer as being silicon oxide, silicon nitride or other suitable material. The gate insulating interlayer covers the thin film transistor

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and provides an adequate material for making contact holes. The contact holes are used to form contacts to source and drain regions of a thin film transistor. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use a material selected from the group consisting of silicon nitride, silicon oxide and nitrated silicon oxide for the interlayer insulating film in order to cover the thin film transistor and provides an adequate material for making contact holes, and since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding claim 52-55, Kadota discloses (see, for example, FIG. 1) a semiconductor device comprising a thin film transistor formed over a TFT substrate (insulating surface) 0 wherein the thin film transistor comprises a semiconductor film 2, source and drain region S/D, channel forming region, gate insulating film, gate electrode 3; first inter-layer insulating film (first interlayer insulating film) 4, electrodes (conductive layer) 7, second inter-layer insulating film (passivation film) 5, color filter 9R/9G/9B, and pixel electrode 1. Kadota does not disclose the second inter-layer insulating film (passivation film) comprising at least a material selected from the group consisting of silicon nitride, silicon oxide and nitrated silicon oxide. However, Seo discloses (see, for example, FIG. 6D) a semiconductor device comprising a passivation film (second interlayer insulating film) 231 over a thin film transistor. In column 10, lines 2-5, Seo discloses the passivation film as being silicon oxide or silicon nitride. The passivation film covers the source and drain electrodes of the thin film transistor and provides an adequate material for making contact holes. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use a material selected from the group consisting of silicon

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nitride, silicon oxide and nitrated silicon oxide in order to cover the source and drain electrodes of the thin film transistor and provide an adequate material for making contact holes, and since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

6. Claims 56, 62, 71, and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 as applied to claims 46, 47, 59, and 65 above, and further in view of Ha 5,677,207. Kadota does not disclose LDD regions. However, Ha discloses (see, for example, FIG. 3G) a semiconductor device comprising LDD regions 38 in contact with a channel area 32a. In column 1, lines 48-63, Ha discloses that LDD areas reduce the electric field between the drain and channel area. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the LDD regions in order to reduce the electric field between the drain and channel area, and reduce leakage current.

7. Claims 57, 58, 63, 64, 72, 73, 75, and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 in view of Seo '521 as applied to claims 48-55, 60, 61, 66 and 67 above, and further in view of Ha 5,677,207. Kadota in view of Seo does not disclose LDD regions. However, Ha discloses (see, for example, FIG. 3G) a semiconductor device comprising LDD regions 38 in contact with a channel area 32a. In column 1, lines 48-63, Ha discloses that LDD areas reduce the electric field between the drain and channel area. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include

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the LDD regions in order to reduce the electric field between the drain and channel area, and reduce leakage current.

8. Claims 77, 78, and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 as applied to claims 46, 47, 59, and 65 above, and further in view of Matsumoto 5,323,042. Kadota does not disclose a driver circuit comprising a second thin film transistor, wherein the pixel matrix circuit and the driver circuit are over a same substrate. However, Matsumoto discloses (see, for example, FIG. 1) a semiconductor device comprising a thin film transistor 12 for a matrix circuit and thin film transistor for a peripheral driving circuit (driver circuit) 13. In column 1, lines 8-48, Matsumoto states that an active matrix type liquid crystal display comprises a matrix circuit for applying an electric field and a peripheral driving circuit for driving the matrix circuit. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a driver circuit in order to drive the matrix circuit in Kadota's LCD device.

9. Claims 79 thru 82, 87, and 88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 in view of Seo '521 as applied to claims 48-55, 60, 61, 66 and 67 above, and further in view of Matsumoto 5,323,042. Kadota in view of Seo does not disclose a driver circuit comprising a second thin film transistor, wherein the pixel matrix circuit and the driver circuit are over a same substrate. However, Matsumoto discloses (see, for example, FIG. 1) a semiconductor device comprising a thin film transistor 12 for a matrix circuit and thin film transistor for a peripheral driving circuit (driver circuit) 13. In column 1, lines 8-48, Matsumoto

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states that an active matrix type liquid crystal display comprises a matrix circuit for applying an electric field and a peripheral driving circuit for driving the matrix circuit. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a driver circuit in order to drive the matrix circuit of Kadota in view of Seo.

10. Claim 68 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 as applied to claims 46, 47, 59, and 65 above, and further in view of Mikoshiba 5,499,123.

Kadota discloses (see FIG. 1) a planarization film (resin film) 10. In column 5, lines 60-65, Kadota discloses the planarization film comprising an acrylic resin or polyimide resin used as an organic transparent material. Kadota does not disclose an electrode over the organic resin film; and an oxide film of the electrode in direct contact with at least a portion of a surface of the electrode, wherein the pixel electrode is in direct contact with at least a portion of the oxide film, and wherein a storage capacitor comprises the electrode and the pixel electrode with the oxide film interposed therebetween. However, Mikoshiba discloses (see, for example, FIG. 3B) a semiconductor device comprising a capacitance element 400 wherein the capacitance element comprises a shading layer (electrode) 312, insulating layer (oxide film) 314, and transparent layer (pixel electrode) 308. In column 4, lines 57-64, Mikoshiba discloses that a bias voltages can be applied to the capacitance element so that a brighter, clearer image can be attained.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include an electrode over the organic resin film; and an oxide film of the electrode in direct contact with at least a portion of a surface of the electrode, wherein the pixel electrode is in direct contact with at least a portion of the oxide film, and wherein a storage capacitor comprises



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the electrode and the pixel electrode with oxide film interposed therebetween in order to apply a bias voltage to an LCD device so that a brighter, clearer image may be attained.

11. Claims 69 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 in view of Seo '521 as applied to claims 48-55, 60, 61, 66 and 67 above, and further in view of Mikoshiba 5,499,123. Kadota in view of Seo discloses a planarization film (resin film) 10. In column 5, lines 60-65, Kadota discloses (see FIG. 1) the planarization film comprising an acrylic resin or polyimide resin used as an organic transparent material. Kadota in view of Seo does not disclose an electrode over the organic resin film; and an oxide film of the electrode in direct contact with at least a portion of a surface of the electrode, wherein the pixel electrode is in direct contact with at least a portion of the oxide film, and wherein a storage capacitor comprises the electrode and the pixel electrode with the oxide film interposed therebetween. However, Mikoshiba discloses (see, for example, FIG. 3B) a semiconductor device comprising a capacitance element 400 wherein the capacitance element comprises a shading layer (electrode) 312, insulating layer (oxide film) 314, and transparent layer (pixel electrode) 308. In column 4, lines 57-64, Mikoshiba discloses that a bias voltage can be applied to the capacitance element so that a brighter, clearer image can be attained. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the electrode over the organic resin film; and an oxide film of the electrode in direct contact with at least a portion of a surface of the electrode, wherein the pixel electrode is in direct contact with at least a portion of the oxide film, and wherein a storage capacitor comprises the electrode and the pixel electrode with oxide film

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interposed therebetween in order to apply a bias voltage to an LCD device so that a brighter, clearer image may be attained.

12. Claim 83 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 in view of Ha '207 as applied to claims 56, 62, 71, and 74 above, and further in view of Matsumoto 5,323,042. Kadota in view of Ha does not disclose a driver circuit comprising a second thin film transistor, wherein the pixel matrix circuit and the driver circuit are over a same substrate. However, Matsumoto discloses (see, for example, FIG. 1) a semiconductor device comprising a thin film transistor 12 for a matrix circuit and thin film transistor for a peripheral driving circuit (driver circuit) 13. In column 1, lines 8-48, Matsumoto states that an active matrix type liquid crystal display comprises a matrix circuit for applying an electric field and a peripheral driving circuit for driving the matrix circuit. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a driver circuit in order to drive the matrix circuit of Kadota in view of Ha.

13. Claims 84 and 85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. '550 in view of Seo '521 in view of Ha '207 as applied to claims 57, 58, 63, 64, 72, 73, 75, and 76 above, and further in view of Matsumoto 5,323,042. Kadota in view of Seo in view of Ha does not disclose a driver circuit comprising a second thin film transistor, wherein the pixel matrix circuit and the driver circuit are over a same substrate. However, Matsumoto discloses (see, for example, FIG. 1) a semiconductor device comprising a thin film transistor 12 for a matrix circuit and thin film transistor for a peripheral driving circuit (driver circuit) 13. In

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column 1, lines 8-48, Matsumoto states that an active matrix type liquid crystal display comprises a matrix circuit for applying an electric field and a peripheral driving circuit for driving the matrix circuit. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a driver circuit in order to drive the matrix circuit of Kadota in view of Seo in view of Ha.

### ***Response to Arguments***

14. Applicant's arguments with respect to claims 46-88 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's argument on page 22, third paragraph in the amendment filed 7/7/04 that the color filter have concavities and convexities, and thus do not have flattened surfaces, this argument is not persuasive. The Examiner agrees that the color filter 9R/9G/9B has concavities and convexities, however, this does preclude the color filter from having a flattened surface. From FIG. 1, the color filter 9R/9G/9B clearly possesses a flat smooth surface even though there are concavities and convexities contained therein. In column 4, lines 34-35, Kadota further discloses the color filter as having a flat smooth surface.

Regarding applicant's argument on page 23, first paragraph that the color filter shown in Kadota et al. apparently does not cover the TFT's and the other cited references do not seem to teach a color filter covering a passivation film and a TFT, this argument is not persuasive. In FIG. 1, Kadota discloses (see, FIG. 1) the color filter 9R/9G/9B as over and clearly covering the TFT (thin film transistor) and the second inter-layer insulating film (passivation film) 5.

### **INFORMATION ON HOW TO CONTACT THE USPTO**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 571-272-1733. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Eugene Lee  
September 18, 2004

A handwritten signature in black ink, appearing to be 'Eugene Lee', with a stylized, flowing script.